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10.051.981	01.16.2002	Zhongze Wang	MI22-1797	1578

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EXAMINER

KENNEDY, JENNIFER M

ART UNIT	PAPER NUMBER
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2812

DATE MAILED: 06/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/051,981

Applicant(s)

WANG, ZHONGZE

Examiner

Jennifer M. Kennedy

Art Unit

2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on 14 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☐ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 3,5,9 and 11-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1,2,4,6-8 and 10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

Art Unit: 2812

### DETAILED ACTION

Applicant's election of Claims 1, 2, 4, 6-8, and 10 in Paper No. 7 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 4, and 7 are rejected under 35 U.S.C. 102(b) as being Ohmi by (U.S. Patent No. 5,021,843).

Ohmi discloses silicon-on-insulator comprising integrated circuitry, comprising:  
a substrate comprising an insulator layer (32) of silicon-on-insulator circuitry, the insulator layer comprising silicon dioxide;

a semiconductive silicon comprising layer (see column 5, lines 10-15) of the silicon-on-insulator circuitry, the silicon comprising layer being received proximate the insulator layer, the silicon comprising layer comprising a pair of source/drains regions

Art Unit: 2812

(34/35) formed therein and a channel region (33) formed therein which is received intermediate the source/drain regions;

a transistor gate (39, 40) received operably proximate the channel region; and  
a silicon nitride comprising region (see column 5, lines 62-66) received intermediate the silicon dioxide comprising layer and the source/drain regions and running along at least a portion of the channel region between the source/drain regions.

In re claim 4 Ohmi discloses the device wherein the silicon comprising layer contacts the insulator layer, the source/drain regions extend to the insulator layer (see Figure 5).

In re claim 7, Ohmi, discloses silicon-on-insulator comprising integrated circuitry, comprising:

a substrate comprising an insulator layer (32) of silicon-on-insulator circuitry, the insulator layer comprising silicon dioxide;

a semiconductive silicon comprising layer (see column 5, lines 10-15) of the silicon-on-insulator circuitry, the silicon comprising layer being received on the insulator layer, the silicon comprising layer comprising a pair of source/drain regions (34/35) formed therein and extending to the insulator layer, the silicon comprising layer comprising a partially depleted channel region which is received intermediate the source/drain regions (see column 7, lines 55-65, and column 11, lines 5-10);

a transistor gate (39, 40) received operably proximate the channel region; and

Art Unit: 2812

a silicon nitride comprising region (see column 5, lines 62-66) received intermediate the silicon dioxide comprising layer and the source/drain regions and running along at least a portion of the channel region between the source/drain regions.

Claims 1, 2, 4, and 6 are rejected under 35 U.S.C. 102(e) as being by Xiang (U.S. Patent No. 6,410,938).

Xiang discloses silicon-on-insulator comprising integrated circuitry, comprising:

a substrate comprising an insulator layer (20) of silicon-on-insulator circuitry, the insulator layer comprising silicon dioxide;

a semiconductive silicon comprising layer (18) of the silicon-on-insulator circuitry, the silicon comprising layer being received proximate the insulator layer, the silicon comprising layer comprising a pair of source/drains regions (40/42) formed therein and a channel region (50) formed therein which is received intermediate the source/drain regions;

a transistor gate (28) received operably proximate the channel region; and

a silicon nitride comprising region (60) received intermediate the silicon dioxide comprising layer and the source/drain regions and running along at least a portion of the channel region between the source/drain regions.

In re claim 2, Xiang discloses the device wherein the silicon nitride comprising region runs along only a portion of the channel region between the source/drain regions (see column 3, lines 45-55, and column 2, lines 58-60).

Art Unit: 2812

In re claim 4, Xiang discloses the device wherein the silicon comprising layer contacts the insulator layer, the source/drain regions extend to the insulator layer (see Figure 1).

In re claims 6, Xiang discloses the device wherein the silicon nitride comprising region has a thickness from about 10 Angstroms to about 50 Angstroms (see column3, lines 30-38).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohmi (U.S. Patent No. 5,021,843).

Ohmi discloses the device as claimed and rejected above, but does not disclose the device wherein the silicon nitride comprising region has a thickness from about 10 Angstroms to about 50 Angstroms.

It would have been obvious matter of design choice to form the structure having the claimed range silicon nitride thickness since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable

Art Unit: 2812

ranges involves only routine skill in the art. In re Aller, 105 USPQ 233. In re Daily, 93 USPQ 47 (CCPA 1966), the court held that changes in size and shape of parts of an invention in the absence of an unexpected result involves routine skill in the art.

Additionally, In Gardner v. TEC Systems, Inc., 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984), the Federal Circuit held that where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.

Claims 7, 8, and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Xiang (U.S. Patent No. 6,410,938) in view of Ohmi (U.S. Patent No. 5,021,843).

Xiang discloses the device as claimed and rejected above, including showing a channel region which seems to not extend to the insulating layer, but does not disclose explicitly a partially depleted channel region. Ohmi discloses the device with a partially depleted channel region, and that the channel region depth can be varied (see column 7, lines 55-65, and column 11, lines 5-10). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have a partially depleted channel region as Ohmi does to create a high resistivity region which is substantially free from impurities.

Art Unit: 2812

In re claim 8, Xiang discloses the device wherein the silicon nitride comprising region runs along only a portion of the channel region between the source/drain regions (see column 3, lines 45-55, and column 2, lines 58-60).

In re claims 10, Xiang discloses the device wherein the silicon nitride comprising region has a thickness from about 10 Angstroms to about 50 Angstroms (see column 3, lines 30-38).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer M. Kennedy whose telephone number is (703) 308-6171. The examiner can normally be reached on Mon.-Fri. 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on (703) 308-3325. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

*jmk*

jmk

June 6, 2003